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Introduction

Thank you for choosing our **Uninterruptible Power Supply** product for protection of your electrical devices.

The B2 Series Uninterruptible Power Supply (UPS) was manufactured using the latest technology. We recommend you to read this manual to learn many specifications and superior features of your new UPS.

We do pay attention to the environmental impacts of this product. Example of some of our measures to protect environment are as follows:

- ✓*Product design is based on economical size and high efficiency approach.*
- ✓*Quality and uninterruptible power is provided without distorting source voltage.*
- ✓*Manufacturing is carried out in our ISO 14001:2004 Environment Management System certified factory.*
- ✓*It is ensured that battery and metal wastes are disposed properly.*

To discover the entire range of our products and to receive up-to-date information, please visit our web site:
……..…….....

Before you call us…

If you require assistance for a failure or any related issues, call our **Technical Support Center**.
For quick assistance, please have the following information available.

Model	**B2 Series**
Power (KVA)	……
Serial Number	……
Purchase Date	……
Installation Date	……
Mains Voltage/Frequency	……
Battery Quantity x Ah	……
Company	……

The B2 Series *products are protected under a patent. Therefore, implementation of our proprietary technology by competitors is not permitted. Given the relevant standards and technology, device hardware configuration may be changed without notice. Technical specifications and dimension information are not binding unless formally confirmed by us.*

Important Safety Information (Be Sure To Read)

Life Safety

- *! Use UPS in an access-restricted room (EN 62040-1-2).*
- *! The UPS has its own power source (batteries). Therefore, there may be live power at the output even if the mains voltage is disconnected.*
- *! There is dangerous level of voltage in the UPS, and it must be opened by an authorized service personnel only.*
- *! The UPS must be grounded in adherence to the rules.*
- *! Do not expose batteries to extreme high temperatures to prevent fire risks.*
- *! Do not attempt to open the battery. Chemical composition of the battery may be dangerous for your skin and eyes.*
- *! Adhere to all regulations that govern disposal of waste batteries.*

Safe Handling

- *! Be careful while carrying loads. Do not carry heavy loads without help.*
- *! Slide roller devices on smooth and even surfaces.*
- *! Do not use slopes with angles over 10°.*
- *! Adhere to following recommendations about load weights.*
  - *! An adult can carry loads up to 18 kg weight.*
  - *! Two adults can carry loads up to 32 kg weight.*
  - *! Three adults can carry loads up to 55 kg weight.*
  - *! Use pallet jack, forklift or similar devices for carrying loads over 55 kg weight.*
- *! Keep packaging material for use in case the UPS has to be transported to an authorized service or to another location.*

UPS Safety

- *! The UPS must be safeguarded against voltage overload or short circuit voltages by means of a readily accessible circuit breaker.*
- *! Do not operate the UPS at environment temperatures or relative humidity that exceeds the limits given in the manual.*
- *! Never operate the UPS in liquid environments or in overly humid environments.*
- *! Never allow water or foreign substances to penetrate in the UPS.*
- *! Strictly do not clog ventilation grids of the UPS.*
- *! Never expose the UPS to direct sunlight or a direct heat source.*
- *! The UPS' useful life is 10 years.*

Special Safety Information

- ***!*** *UPS' electrical connections must be provided as shown in the manual.*
- ***!*** *Be sure to check the compatibility of the UPS power to mains voltage and to total load that will be supplied with UPS.*
- ***!*** *UPS must be stored in a dry environment between -10°C and 45°C temperature prior to commissioning.*
- ***!*** *UPS must be operated at least once a month continuously for 24 hours to charge the batteries.*
- ***!*** *Because the battery life commences on the manufacture date, storage life is limited.*

- ***!*** *UPS is designed to operate at height, operating environment temperature, relative humidity rate, and handling and storage conditions described in UPS manual.*
- ***!*** *Special design and protection measures are essential for non-normal operating conditions. Such non-normal operating conditions include:*
  - *Harmful fume, dust, abrasive dust;*
  - *Humidity, vapor, bad weather, frost;*
  - *Explosive dust and gas mixtures;*
  - *Extreme temperature changes;*
  - *Poor ventilation;*
  - *Exposure to direct or radiated temperature from other sources;*
  - *Intensive electromagnetic fields and harmful radioactive levels;*
  - *Insects, pests, fungus, etc.*

Change and Recycling of Batteries

- ***!*** *Battery poses electric shock hazard and short circuit risks.*
- ***!*** *Replace only with batteries of same type, capacity, number and dimensions.*
- ***!*** *Battery replacement must be carried out by trained service personnel only.*

- ***!*** *Remove metal accessories such as wristwatch, ring, etc. and wear rubber shoes and gloves to prevent accidents and personal injury.*
- ***!*** *Use tools with isolated handles.*
- ***!*** *Make sure that battery connections are not grounded by mistake.*
- ***!*** *Do not leave tools or metal pieces on batteries.*
- ***!*** ***Batteries must be recycled.*** *Return mutilated batteries to any recycling facility or to company where you initially purchased them along with packaging material of new batteries.*

UPS must be installed in strict adherence to following standards:

- ✓ *HD 384.4.42 S1: Electrical Installation in Buildings, Chapter 4: Safety Protection Group 42: Protection Against Thermal Effects*
- ✓ *HD 384.4.482.S1: Electrical Installation in Buildings, Chapter 4: Safety Protection Group 48: Choosing Protective Measures Against External Effects – Section 482: Fire Protection in Places Bearing Special Risks or Dangers*

1. Overview

1.1. B2 Series

UPS Cabin

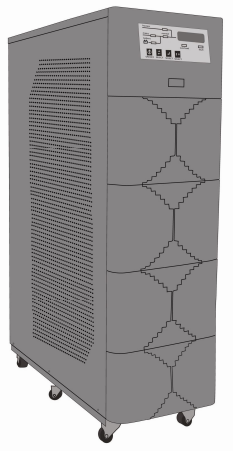


Figure 1.1 UPS Cabin

Dimensions	
UPS Power (KW/KVA)	**Width x Height x Depth (mm)**
7/10	255 x 870 x 730
10.5/15	
14/20	

Backup Time (min) (100% load/50% load)	**Net Weight (kg)**		
	10KVA	**15KVA**	**20KVA**
0/0	50	50	50
2/5			113
3/7	92	113	125
4/11	100	125	
5/13	113		
7/22	125		

Table 1.1 UPS Cabin Dimensions and Weights

External Battery Cabin *(optional)*

Figure 1.2 External Battery Cabin

Dimensions
Width x Height x Depth (mm)
255 x 710 x 640

Backup Time (min) (100% load/50% load)	**Net Weight (kg) (UPS Cabin/External Battery Cabin)**		
	10KVA	**15KVA**	**20KVA**
0/0	50/30	50/30	50/30
5/13			50/156
7/22		50/156	50/180
9/25			113/156
11/34	50/130	50/180	
13/39	50/156	113/156	125/180
25/70	113/156		
41/110	125/180		

Table 1.2 External Battery Cabin Dimensions and Weights

1.2. Front Panel

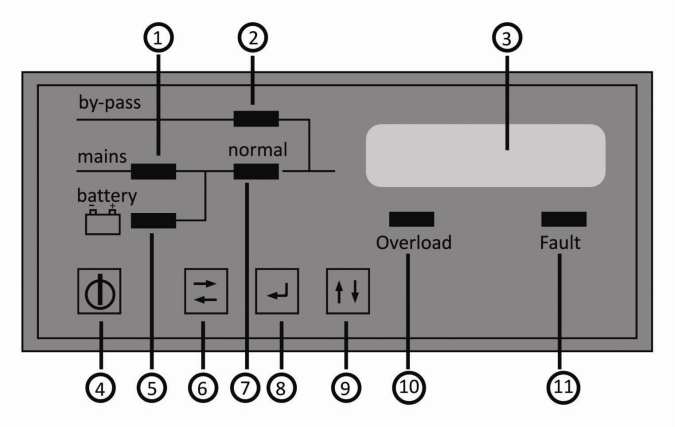


Figure 1.3 Front Panel

No.	LED	On	Off
1	**mains**	Mains voltage(s) is (are) normal.	Mains voltage(s) is (are) NOT within the tolerance limits.
2	**by-pass**	In static bypass mode	Not in static bypass mode
5	**battery**	In battery mode	Not in battery mode
7	**normal**	In normal mode	Not in normal mode
10	**Overload**	*See: '3.8 Overload'*	UPS is loaded 0% to 100%.
11	**Fault**	*See: '3.9 Audio Warnings'*	No fault warning
3	**Display**	*Liquid Crystal Display (LCD)* where operation information is shown.	

No.	BUTTON	>3 seconds *(Press and hold longer than 3 seconds)*	<3 seconds *(Press less than 3 seconds)*
4		✓ On ✓ Off	✓ In normal mode: cancel execution/task ✓ In bypass mode: confirm execution/task ✓ Turning on/off warning sound
6		✓ Reversing the menu and the sub-menu order	✓ Browsing through menu and sub-menu options ✓ Manual battery test start/stop
8			✓ Exit from sub-menu ✓ Cancel switching to bypass mode
9		✓ Reversing the warning list order	✓ Entry to sub-menu ✓ Browsing through warning list

Table 1.3 Front Panel Operation

2. Installation

2.1. Placement

UPS Placement

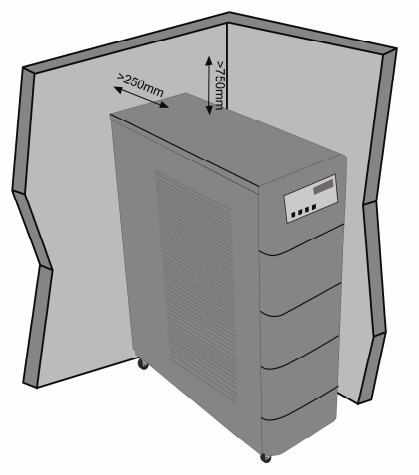


Figure 2.1 UPS Placement

- ! Do not install the UPS on an uneven ground or in outdoors.
- ! Note that ventilation holes on side covers must not be clogged.
- ! Do not install the UPS in places with liquid installation or places subject to fire risks.
- ! Do not install the UPS in places where it will be exposed to direct sunlight or affected of heat sources.
- ! Heed to minimum distance requirement between the UPS and nearby walls and/or devices.
- ! Do not install the UPS in places where it may be subject to vibration or impacts.
- ! Do not install the UPS in environments with excessive (too high or too low) humidity levels.
- ! Do not operate the UPS in dusty or filthy environments.

Do not leave any materials on or around the UPS to facilitate and expedite maintenance and repair operations.

The UPS may overheat if distance requirements are not met. Moreover, this may complicate maintenance and repair operations.

The UPS must be installed in a room with restricted access (Authorized Personnel Only).

External Battery Cabin Placement

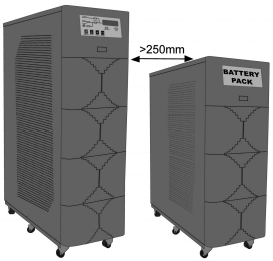


Figure 2.2 External Battery Cabin Placement

✓ ***Heed to UPS placement instructions when placing the external battery cabin.***

2.2. Back Panel

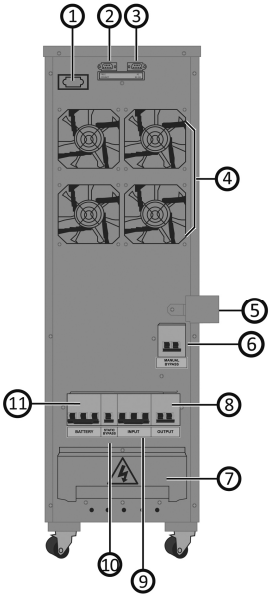


Figure 2.3 Back Panel

No.	Part	Function
1	**SNMP**	Metal cover is removed and adaptor is plugged in to this port if SNMP is used *(See: '2.6 Communication with PC')*.
2	**RS232**	It ensures that the UPS can be monitored using a computer software *(See: '2.6 Communication with PC')*.
3	**Custom Contacts**	It has *'Gen-Set'* and *'EPO'* user input pins; *'Battery Mode'*, *'Battery Low'* and *'Fault'* user output pins *(See: '2.7 Custom Contacts')*.
4	**Fans**	They work depending on the loading percentages and cool the rectifier and the inverter units.
5	**Manual Bypass Circuit Breaker Cover**	It is used to prevent unauthorized persons' intervention to normal operation.
6	**Manual Bypass Circuit Breaker**	It ensures that loads are supplied mains voltage during a malfunction or maintenance.
7	**Terminal Cover**	It is used to prevent the contact with live contacts.
8	**Output Circuit Breaker**	It ensures overload and short-circuit protection. Also, it is used to switch on/off the output voltage.
9	**Input Circuit Breaker**	It ensures overload and short-circuit protection. Also, it is used to switch on/off the mains voltage(s).
10	**Static Bypass Circuit Breaker**	It ensures overload and short-circuit protection. Also, it is used to switch on/off the static bypass voltage.
11	**Internal Battery Circuit Breaker**	It ensures overload and short-circuit protection. Also, it is used to switch on/off the battery voltage.

Table 2.1 Back Panel Operation

2.3. Connection

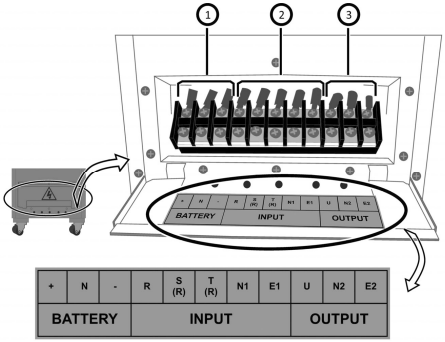


Figure 2.4 Connections

No.	Connections					
1	**BATTERY** ***(External Battery Cabin)***	**+**	**N**	**-**		
		(+) pole	Middle point	(-) pole		
2	**INPUT**	**R**	**S (R)**	**T (R)**	**N1**	**E1**
		Phase-R	Phase-S (R)	Phase-T (R)	Neutral	Earth
3	**OUTPUT**	**U**	**N2**	**E2**		
		Phase-U	Neutral	Earth		

Table 2.2 Terminals

Correct input connection, three-phase or single-phase, must be carried out at first installation. Phase transformation can be done by authorized service personnel only.

2.4. Recommended Cable Cross-section and Circuit Breakers (CBs)

	Cable Cross-section (mm^2)			Circuit Breaker (A)		
	10KVA	**15KVA**	**20KVA**	**10KVA**	**15KVA**	**20KVA**
Input	4x4	4x4	4x6	C 3x25	C 3x25	C 3x32
Output	2x6	2x6	2x10	C 2x40	C 2x40	C 2x50
Internal Battery	3x6	3x6	3x6	C 3x40	C 3x40	C 3x63
External Battery	3x6	3x6	3x6	C 3x40	C 3x40	C 3x63
Static Bypass	2x6	2x6	2x10	C 1x80	C 1x80	C 1x100
Manual Bypass	2x6	2x6	2x10	C 1x80	C 1x80	C 1x100
Earth	1x6	1x6	1x10			

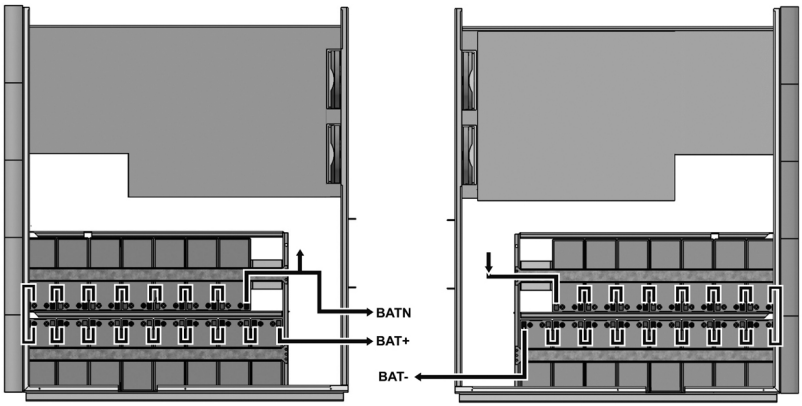
Table 2.3 Cable Cross-section and Circuit Breakers

The cables and the CBs must be replaced with the cables and the CBs of same type and capacities only.

2.5. Battery Placement and Connections

UPS Cabin

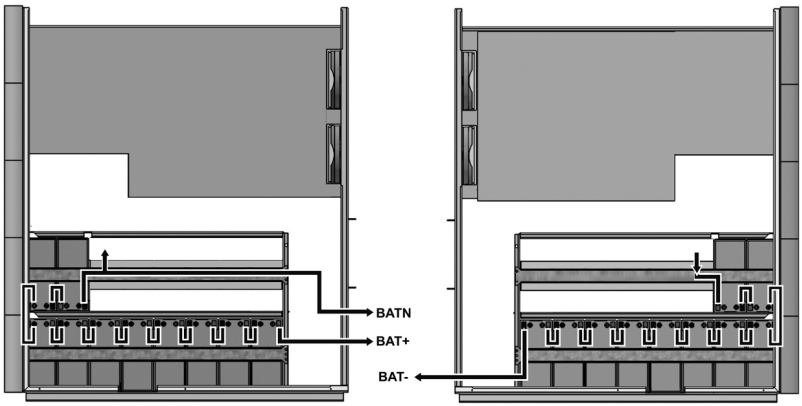
- **30 pieces of 7-9Ah**



(left side) *(right side)*

Figure 2.5 30 pieces of 7-9Ah Battery Placement and Connections

- **20 pieces of 7-9Ah**

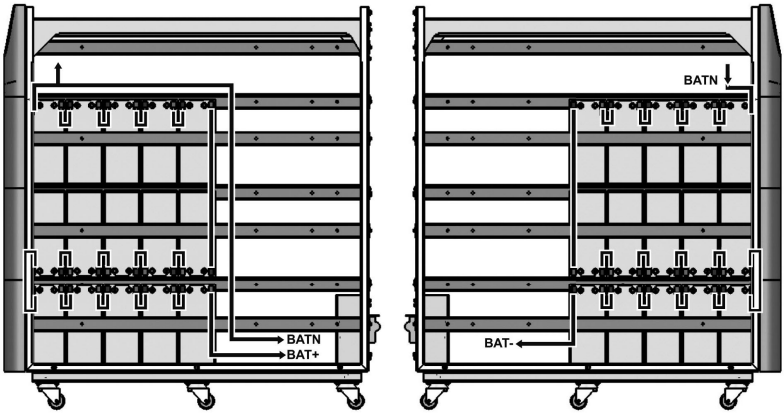


(left side) *(right side)*

Figure 2.6 20 pieces of 7-9Ah Battery Placement and Connections

External Battery Cabin

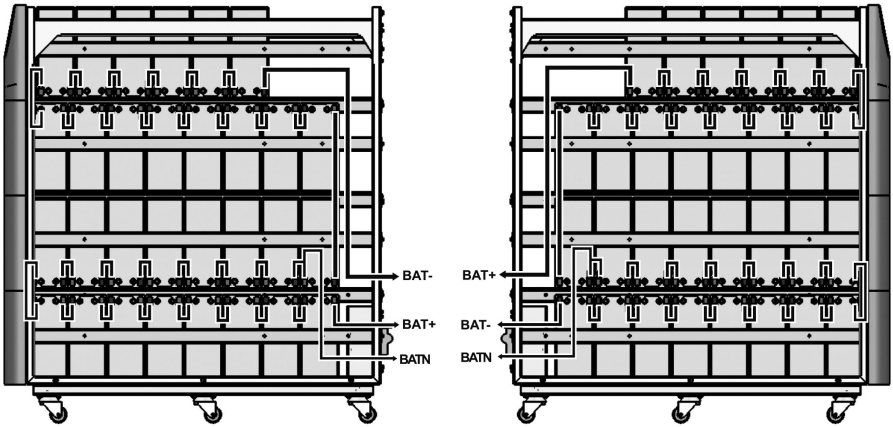
- **30 pieces of 7-9Ah**



(left side) *(right side)*

Figure 2.7 30 pieces of 7-9Ah Battery Placement and Connections

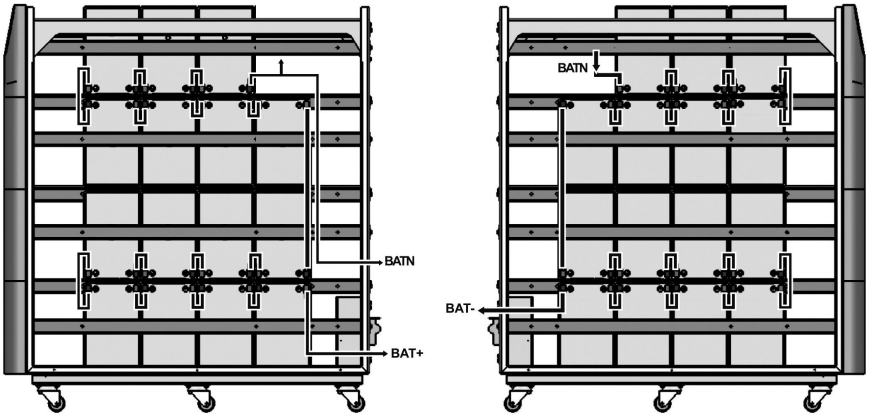
- **2x30 pieces of 7-9Ah**



(left side) *(right side)*

Figure 2.8 2x30 pieces of 7-9Ah Battery Placement and Connections

- **30 pieces of 12Ah**



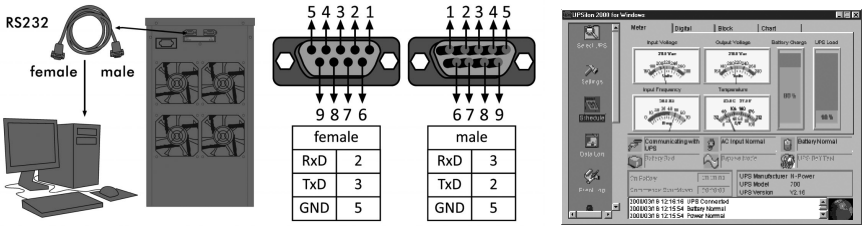
(left side) *(right side)*

Figure 2.9 30 pieces of 12Ah Battery Placement and Connections

2.6. Communication with PC

RS232

You can monitor the UPS over RS232 port using *UPSilon2000* software that you will install on your computer *(this is optional and therefore UPS software and RS232 cable must be ordered prior to use of this option)*. Using this software, you can monitor real-time UPS voltage and current information, battery information, malfunctioning warnings, etc. and save long term logs with graphics. In addition, software shuts down your computer and/or server safely in case of any electrical power outage.



female	
RxD	2
TxD	3
GND	5

male	
RxD	3
TxD	2
GND	5

Figure 2.10 RS232 Communication

SNMP *(optional)*

SNMP *(Simple Network Management Protocol)* is an advanced communication protocol. Using SNMP, multiple UPSs can be synchronously monitored and managed from a single common center. SNMP can be connected to a computer or a network over an

'*Ethernet*' communication port. An IP (Internet Protocol) number assigned to SNMP is used to connect to a UPS from anywhere on the network and monitor real time operation information, save long term logs, carry out testing, and turn on/off the UPS or the server.

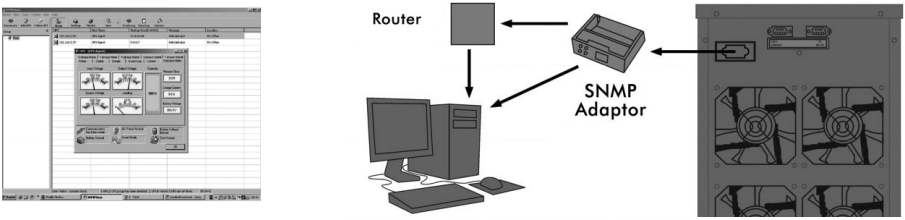
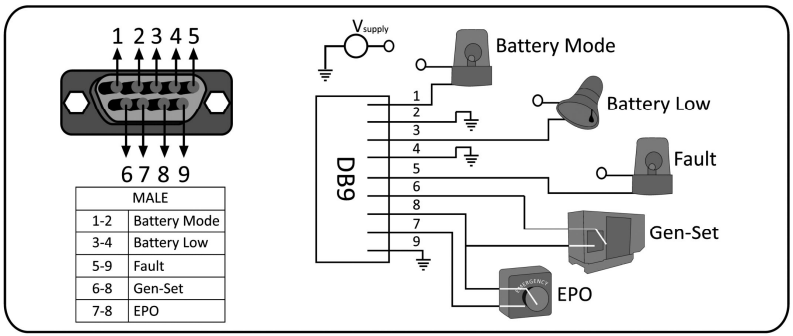


Figure 2.11 SNMP Communication

2.7. Custom Contacts

When you use the UPS in environments where the UPS cannot be under consistent surveillance, you can have remote signals for power outage, audibly or visually. Using the outputs mentioned on a simple bell, siren or light circuit, the mains voltage and the battery capacity can be monitored. In this way, loads can be protected by being safely shut down. Also, user inputs ensure energy saving and reliable operation.

Supply voltages of the user output circuits must NOT be higher than 50V.



MALE	
1-2	Battery Mode
3-4	Battery Low
5-9	Fault
6-8	Gen-Set
7-8	EPO

Figure 2.12 Custom Contacts

Battery Mode
Audible or lighting device works during the UPS is in battery mode.

Battery Low
Audible or lighting device works during the battery capacity is less than 20%.

Fault
Audible or lighting device works during fault warnings.

Gen-Set
For energy saving, the UPS does not charge the batteries during gen-set is working.

EPO *(Emergency Power Off)*
It is used during a crisis *(natural disaster or emergency)* to prevent damage to the UPS and the load.

3. Operation

3.1. Switching On

1. Mains Start:

a. Make sure that the connections are performed properly. Switch on the 'INPUT', the 'STATIC BYPASS and then the 'BATTERY' CB *(Figure 3.1)*. Press and hold ⏻ button until a warning beep sound, meanwhile observe the 'normal' LED is on *(Figure 3.2)*.

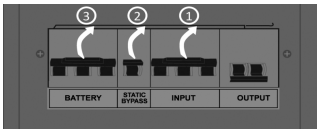


Figure 3.1

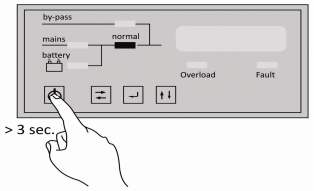


Figure 3.2

b. If the mains voltage(s) is (are) within the limits, the 'mains' and the 'by-pass' LED will be on *(Figure 3.3).* Press button ⏻ shortly and observe the 'Mains Start' warning *(Figure 3.4)*. If the mains voltage(s) is (are) out of the limits, the 'Fault' LED will be on and a warning beep will be heard *(See: 'Cold Start')*.

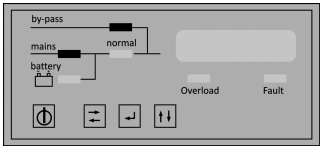


Figure 3.3

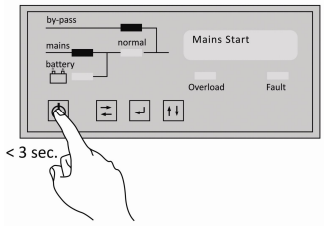


Figure 3.4

c. Simultaneously, the 'by-pass' LED is off and the 'normal' LED is on. And, the UPS starts operating in normal mode *(Figure 3.5)*. In this case, you can switch on the 'OUTPUT' CB and supply your loads from the UPS *(Figure 3.6)*. If the 'Fault' LED and an audible warning is on, display the '07-WARNING' menu and see '5. WARNINGS'.

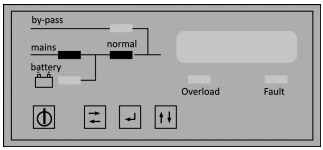


Figure 3.5

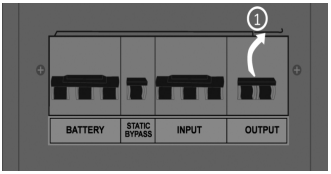


Figure 3.6

2. Cold Start:

The UPS has 'Cold Start' feature. It means that the UPS can be switched on battery without mains connection.

a. Switch on the 'BATTERY' CB *(Figure 3.7)*. Press and hold ⏻ button until a warning beep sound, meanwhile observe the 'normal' LED is on *(Figure 3.8)*.

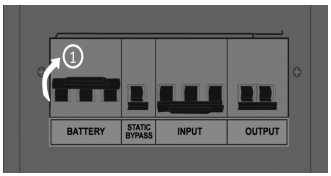


Figure 3.7

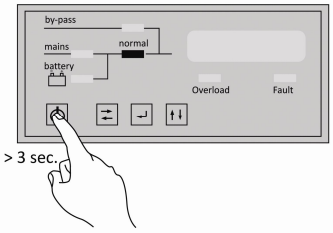


Figure 3.8

b. The 'Fault' LED is on since the mains voltages are not present and an audible warning is heard periodically. Press ⏻ button shortly to turn off the audible warning *(Figure 3.9)*, press shortly again and see the 'Batt Start' warning *(Figure 3.10)* and wait until the 'battery' and the 'normal' LED are on. If the 'Fault' LED and an audible warning is on, display the '07-WARNING' menu and see '5. WARNINGS'.

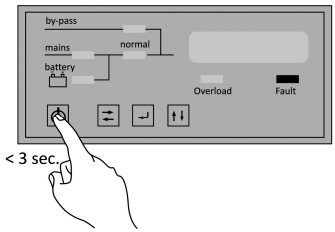


Figure 3.9

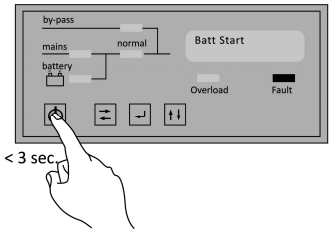


Figure 3.10

c. When the 'battery' and the 'normal' LED are on *(Figure 3.11)*, you can switch on the 'OUTPUT' CB and supply your loads from the UPS *(Figure 3.12)*.

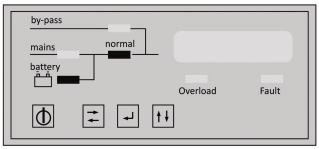


Figure 3.11

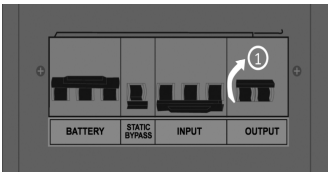


Figure 3.12

3.2. Switching Off

1. **If the UPS is in Normal Mode:** Switch off your loads safely. Press ⏻ button short. Press ⏻ button short again to confirm bypass operation and observe the 'by-pass' and the 'mains' LED turn on *(Figure 3.13, Figure 3.14)*. Press ↵ button to cancel the confirmation.

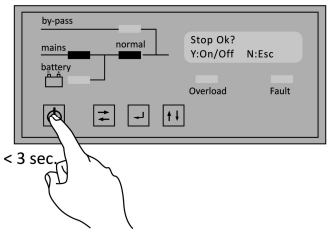


Figure 3.13

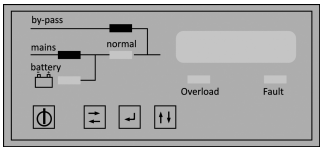


Figure 3.14

The UPS must be switched to 'Static Bypass Mode' prior to fully switching off after normal mode.

2. **If the UPS is in Static Bypass Mode:** Press and hold ⏻ button until the warning beep silences *(Figure 3.15)*. Observe that the display is fully switched off. Switch off the 'OUTPUT', the 'BATTERY', the 'STATIC BYPASS' and the 'INPUT' CB in respective order *(Figure 3.16)*.

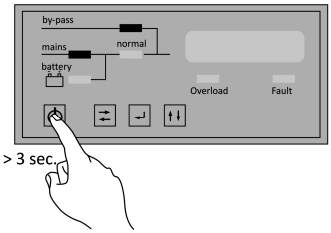


Figure 3.15

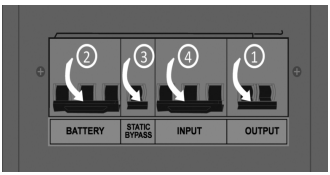


Figure 3.16

3. **If the UPS is in 'Cold Start' Mode:** Switch off your loads safely. Press and hold ⏻ button until warning beep silences *(Figure 3.17)*. Observe that the display is fully switched off. Switch off the 'OUTPUT' and the 'BATTERY' CB in respective order *(Figure 3.18)*.

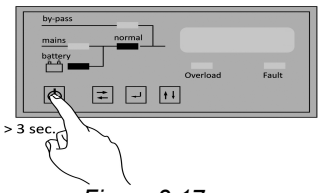


Figure 3.17

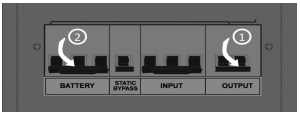


Figure 3.18

3.3. Manual Bypass Circuit Breaker Usage

Do not switch on the 'MANUAL BYPASS' CB during the UPS is in normal mode.

During maintenance or malfunction, please carry out the following instructions.

1. Remove the 'MANUAL BYPASS' CB cover *(Figure 3.19)*.

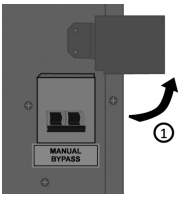


Figure 3.19

2. Switch on the 'MANUAL BYPASS' CB; switch off the 'OUTPUT', the 'BATTERY', the 'STATIC BYPASS' and the 'INPUT' CB *(Figure 3.20)*.

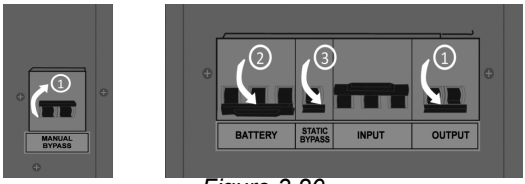
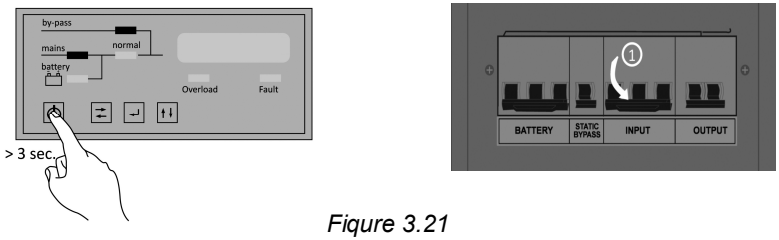


Figure 3.20

3. Press and hold ⏻ until warning beep silences. Observe that the display is fully switched off and switch off the 'INPUT' CB *(Figure 3.21)*.



Fiqure 3.21

The 'OUTPUT', the 'BATTERY', the 'STATIC BYPASS' and the 'INPUT' CB must be surely switched off during the 'MANUAL BYPASS' CB is on.

User will be responsible for any load or UPS malfunctions that may be experienced when switched to 'Manual Bypass Mode' without switching off the loads and the UPS first.

3.4. Operation Principle

The B2 Series UPS has *Online-Double Conversion* and *Three-Level Inverter* technologies. The online-double conversion technology ensures a double energy conversion simultaneously and a mains-independent output voltage and frequency. It is the most reliable technology to protect critical loads. Also, the three-level inverter technology ensures a high efficiency operation. The B2 Series UPS has following operation principle.

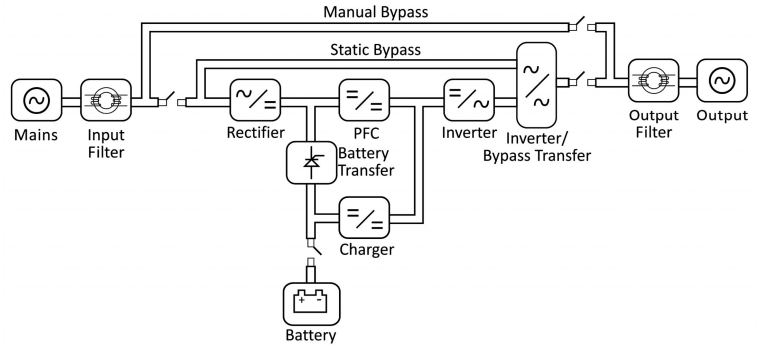


Figure 3.22 Operation Principle

Mains
It is a three-phase or a single-phase AC input voltage supply which provides input power.

Input Filter
It filters EMI *(Electromagnetic Interference)* and RFI *(Radio Frequency Interference)* effects of the mains.

Rectifier
It converts the three-phase or the single-phase AC input voltage to DC voltage.

PFC *(Power Factor Correction)*
It corrects input power factor, boosts the DC voltage and generates DC bus voltage.

Inverter
It converts the DC bus voltage to a single-phase AC voltage.

Battery
It stores electrical energy. The quantity of a battery group is 20 or 30 for 10KVA, 30 for 15KVA and 20KVA.

Charger
It converts the DC bus voltage to battery charge voltage and charges the battery group.

Battery Transfer
It transfers the battery voltage to input of the PFC unit.

Output
It is a single-phase AC output voltage which provides output power.

Inverter/Bypass Transfer
It transfers the output voltage to the inverter voltage or the mains voltage continuously.

Output Filter
It filters EMI *(Electromagnetic Interference)* and RFI *(Radio Frequency Interference)* effects of the UPS.

3.5. Operation Modes

Static Bypass Mode
The mains voltage is transferred to output via the static bypass line and the inverter/bypass transfer unit. It is used to supply output from mains continuously in case of any malfunctions. Thus, malfunction does not affect output. Meanwhile, battery is not charged or discharged. **Once the static bypass voltage is out of the limits, the output voltage is interrupted.**

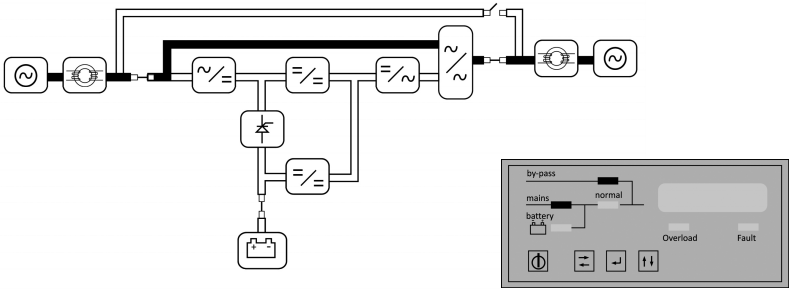


Figure 3.23 Static Bypass Mode

Normal Mode
Rectifier, PFC and inverter operate. A mains-independent single-phase voltage is generated and transferred to output via the inverter/bypass transfer unit. Meanwhile, the charger charges the batteries as appropriate. It is the online-double conversion mode of the UPS.

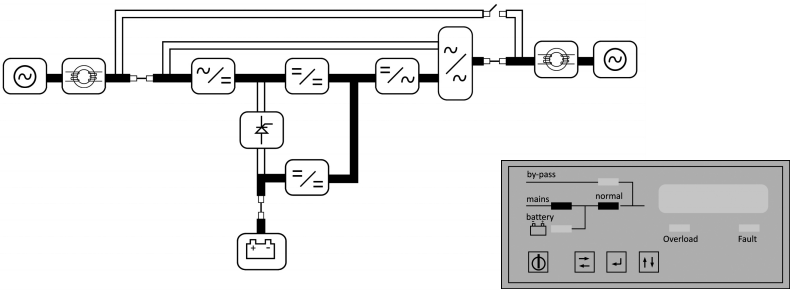


Figure 3.24 Normal Mode

Battery Mode

Once the mains voltage(s) is (are) out of the limits, rectifier and charger doing not operate. The battery voltage is transferred to input of the PFC unit. PFC and inverter continue to operate from battery. The single-phase inverter voltage is transferred to output via the inverter/bypass transfer unit.

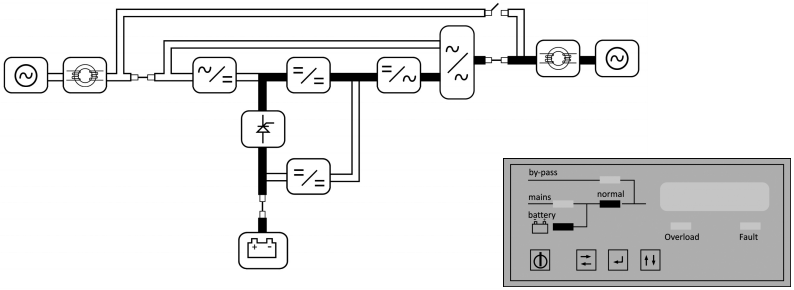


Figure 3.25 Battery Mode

Economical Mode *(Eco-Mode)*

It is the highest efficiency operation mode. Rectifier, PFC and charger operate, inverter stands by. Normally, the UPS operates in static bypass mode. Once the static bypass voltage is out of the limits, the UPS switches to normal mode. If the mains voltage(s) is (are) out of the limits, the UPS switches to battery mode continuously.

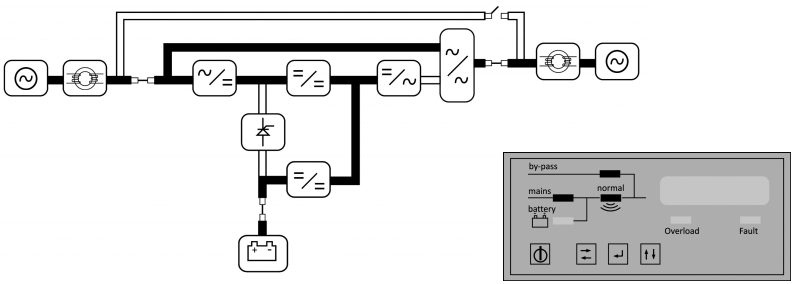


Figure 3.26 Economical Mode

Manual Bypass Mode

It is used to supply output from mains during maintenance or malfunction *(See: '3.3 Manual Bypass Circuit Breaker Usage)*.

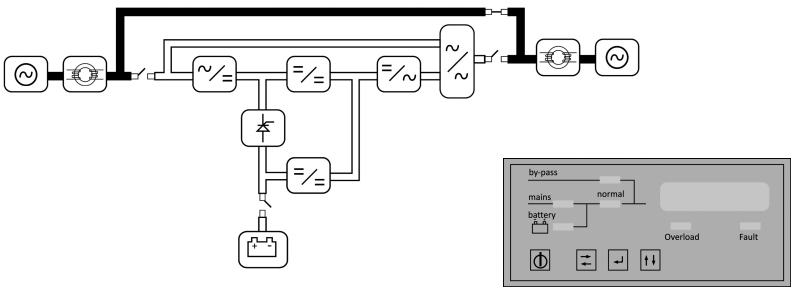


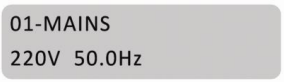
Figure 3.27 Manual Bypass Mode

3.6. User Menu

01-MAINS

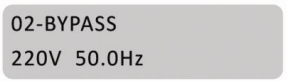
(3-phase input)

Instant information for mains voltage(s) is displayed.



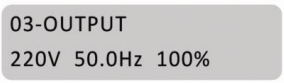
02-BYPASS *(1-phase input)*

Instant information for static bypass voltage is displayed.



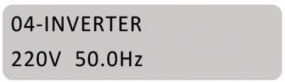
03-OUTPUT

Instant information for output voltage and loading ratio is displayed.



04-INVERTER

Instant information for inverter voltage is displayed.

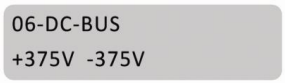


05-BATTERY

Instant information for battery charge voltage and capacity is displayed.
Note: The capacity percentage may NOT be exactly correct. Battery charge voltage is 270V or 405V for 10KVA, 405V for 15KVA and 20KVA.

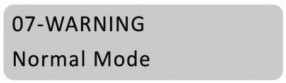
06-DC-BUS

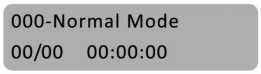
Instant information for DC bus voltages is displayed.

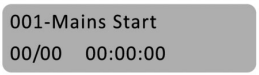


07-WARNING

The last 128 real time event log is displayed.







08-MISCELLANEOUS

Hour, date, internal temperature and firmware information is displayed. Also, manual battery test can be executed.

01-HOUR

Hour, minute and second information is displayed.

02-DATE
Day, month and year information is displayed.

02-DATE
01/01/2010

03-TEMPERATURE
Instant information for internal temperature is displayed.

03-TEMPERATURE
22.0 degree

04-BATTERY TEST
Manual battery test can be started and stopped.

04-BATTERY TEST
off

05-PROGRAM NAME
Rectifier and inverter firmware name is displayed.

05-PROGRAM NAME

01-RECTIFIER
The rectifier firmware name is displayed.

(3-phase input)

01-RECTIFIER
BB3R_V100

02-INVERTER
The inverter firmware name is displayed.

02-INVERTER
BB3I_V100

(1-phase input)

01-RECTIFIER
BB1R_V100

02-INVERTER
BB1I_V100

3.7. Automatic and Manual Battery Test

The UPS operates in battery mode and carries out automatic battery test along 1 minute at 12:00pm in 15th day of every month. Also, the test can be carried out manually under the '08-MISCELLANEOUS' menu and the '04-BATTERY TEST' sub-menu. Both of tests can be started during the UPS is in normal mode. If the UPS is in static bypass mode or completely off during test day, the test is carried out in the next normal mode.

It is checked that the batteries are damaged, or not during the test. If the battery test is positive, 'Battery Test' is displayed under the '07-WARNING' menu. Otherwise, 'Batt Fault' is displayed and an audible warning is heard. In this case, call the Technical Service.

'Automatic Battery Test' may also be carried out after long power outages. In this case, the 'Batt Fault' test result should be disregarded.

An 'Automatic Battery Test' or a 'Manual Battery Test' on batteries charged for at least 10 hours should be regarded.

The 'Automatic Battery Test' period and the test time cannot be changed.

3.8. Overload

During overload; the UPS may run in normal operating conditions for below defined-periods. The UPS goes to static bypass mode when the below defined periods are exceeded.

Loading Ratio	Power (kVA)			Running Time
	10	15	20	
%110-%125	11-12.5	16.5-18.75	22-25	60 seconds
%125-%150	12.5-15	18.75-22.5	25-30	10 seconds
>%150	>15	>22.5	>30	3 seconds

Table 3.1 Overload Table

The UPS has 150% overload capacity at most when running in static bypass mode.
When the load ratio increases further, the UPS shuts down the output.

3.9. Audible Warnings

Alarm	Warning Info		
3 times consecutively at every 5 seconds	*CPU Error*	*OverCur Rec*	*Inv Fault*
	Phase Fault	*Output S/C*	*Output Fault*
	Emergcy Stop	*OverHeat Inv*	*InvScr Fault*
	Manual Byp	*OverHeat Rec*	*UPS Shutdown*
	Pwm Fault	*Dc High*	*Over Load*
	OverCur Flt	*Dc Low*	*Synchron Flt*
	OverCur Byp	*Battery High*	*Charger Fail*
	OverCur Igbt	*Batt Fault*	*Fan Failure*
	OverCur Inv	*Battery Low*	*BypScr Fault*
2 times consecutively at every 2 minutes	*Battery Test*		
	Freq Fault		
	Battery Mode		
	Mains Low		
	Mains High		

Table 3.2 Audible Warnings

Press button to turn off the warning sound. Press again to turn on.

4. Maintenance

The UPS should only be opened by authorized personnel.

The UPS must be completely off during maintenance. Mains and battery connections must be disconnected and batteries must be moved away from the UPS.

Follow the 'Important Safety Information' and 'Installation' instructions during the maintenance.

- ! The electronic boards and the fans should be cleaned regularly.
- ! The ventilation holes on the lid should be cleaned regularly.
- ! The UPS body should be cleaned with a soft and moist cloth.
- ! The sturdiness of cable connections, screws and sockets should be checked.
- ! The board supply voltages should be measured and checked.
- ! The components on the boards and the other hardware should be checked.
- ! The voltages of the batteries should be checked by measuring the voltages separately.
- ! The accuracy of the calibration and the adjustments should be checked.
- ! The dust, the heat and the temperature in the UPS room should be checked.
- ! The instructions in the '*Important Safety Information and Installation'* should be complied.

5. Warnings

Event	Definition
Batt Fault[1]	The batteries may be expired *(See: '3.7 Automatic and Manual Battery Test')*.
Batt Start[3]	The UPS is started on battery.
Battery High[2]	The battery voltage is higher than the normal value.
Battery Low[1]	The battery capacity is low.
Battery Mode[3]	The UPS runs on battery.
Battery Test[3]	Automatic or manual battery test is carried out.
Bypass High[1-5]	The static bypass voltage is higher than the upper limit.
Bypass Low[1-5]	The static bypass voltage is less than the lower limit.
Bypass Mode[2]	The UPS is in static bypass mode.
BypScr Fault[5]	The UPS cannot transfer the static bypass voltage to output.
Charger Fail[2]	Battery quantity or cable connection is not proper or the charger is faulty.
CPU Error[5]	A fault was occurred in microprocessor.
Dc High[2]	The DC bus voltage is above upper limit.
Dc Low[2]	The DC bus voltage is below lower limit.
Emergcy Stop[5]	The UPS output is shut down using the 'EPO' custom contact.
Fan Failure[2]	The rectifier and the inverter fans are not working.
Freq Fault[3]	Mains frequency is out of the limits.
Inv Fault[2]	The inverter unit cannot generate the output voltage.
InvScr Fault[2]	Inverter voltage cannot be transferred to output.
Mains High[3]	Mains voltage is above the upper limit.
Mains Low[3]	Mains voltage is below the lower limit.
Mains Start[4]	The UPS is started when mains voltage(s) is (are) within the limits.
Manual Byp[1-2]	The 'MANUAL BYPASS' CB was switched on *(optional)*.
Normal Mode[4]	The UPS is in normal mode.
Output Fault[5]	A fault was occurred in the inverter unit.
Output S/C[5]	Short circuit at the loads, at the output, at the beam box or at the line.
Over Load[1-2]	The UPS is overloaded *(See: '3.8 Overload')*.
OverCur Byp[5]	Instant high current was drawn from output during bypass mode.

OverCur Flt[2]	Instant high current was drawn from output at least 3 times during normal mode.
OverCur Igbt[2]	Internal malfunction in the UPS or instant high current was drawn from output during normal mode.
OverCur Inv[2]	Instant high current was drawn from output during normal mode.
OverCur Rec[2]	Instant high current was drawn from mains during normal mode.
OverHeat Inv[2]	Temperature of the inverter unit is higher than 75°C.
OverHeat Rec[2]	Temperature of the rectifier unit is higher than 75°C.
Phase Fault[1]	Mains phase squence is wrong.
Pwm Fault[2]	A fault was occured at switching signals.
Stop Mode[2]	The UPS was switched to static bypass mode from normal mode.
Synchron Flt[2]	The output voltage and the mains voltage(s) are at different values.
UPS Shutdown[5]	The UPS has shut down the system, since the battery capacity is at its lowest.

Table 5.1 Warnings Table

[1]: Operation mode remains unchanged.
[2]: Switches to bypass mode.
[3]: Switches to battery mode.
[4]: Switches to normal mode.
[5]: Shuts down the output.

6. Troubleshooting

Make sure you go through the table below before contacting the Technical Service.

Cable connections and CB checks must be performed by authorized personnel only.

Definition of Failure	Possible Cause	Solution
The UPS is not being switched on and the leds are off.	⏻ button is pressed snortly.	Press ⏻ button untill a warning beep sound.
	CBs are switched off.	Switch on the CBs in appropriate order.
	Problem with cable connections.	Check input and battery cable connections.
	Contact Technical Service.	
'Mains Low' warning received.	Mains voltage(s) is (are) out of the limits.	Check the mains voltage(s) on the front panel.
	Problem with cable connections.	Check input cable connections.
	Input CB failure.	Check the input CB.
	Contact Technical Service.	
'Fault' led is on and the UPS gives audible warning.	'Phase Fault' warning	Check mains phase squence.
	'Battery Low' warning	See: '5. WARNINGS'
	'Battery Mode' warning	
	'Mains High' warning	
	'Batt Fault' warning	See: '3.7 Automatic and Manual Battery Test'
	'OverHeat Rec' warning	Check the UPS load ratio and the environment temperature. Shut down the UPS and wait for a while.
	'OverHeat Inv' warning	
	'Emergcy Stop' warning	Switch off the UPS and switch on it again.
	'OverCur Flt' warning	
	'Output Fault' warning	
	'Output S/C' warning	Switch off the UPS. Make sure there is no short circuit on loads before switching the UPS back on.
	'Charger Fail' warning	Check the battery connections.
	Contact Technical Service.	
'Overload' led is on and the UPS gives audible warning.	'Over Load' warning	Check the load ratio. Reduce the loads connected to the UPS output.
Time for running on battery is too low.	Batteries were not fully recharged.	Check back again once the batteries were recharged for at least 8 hours.
	Contact Technical Service.	

Table 6.1 Troubleshooting Table

7. Technical Specifications

TECHNICAL SPECIFICATIONS		
B2 SERIES		
Power (KVA)	15	20
INPUT		
Voltage	380 / 400 / 415 Vac 3ph + N	
Voltage tolerances	- 25%, +20% (without downgrading)	
Frequency	50 / 60 Hz	
Frequency tolerances	± 10%	
Power factor	≥ 0.99	
THDi	< 8%	
OUTPUT		
Voltage	220 / 230 / 240 Vac 1ph + N	
Voltage tolerances	± 1% (static load), dynamic load in accordance with VFI-SS-11	
Frequency	50 / 60 Hz	
Frequency tolerances	± 0.1% (self-synchronize), ± 1% (mains-synchronize)	
Power factor	0,7 (0.8 optional)	
THDv	≤ 1% (linear load), ≤ 5% (non-linear load)	
Crest factor	3:1	
OVERLOAD CAPACITY		
≤ 110%	30 min.	
≤ 130%	10 min.	
≤ 150%	1 min.	
≤ 160%	10 sec.	
EFFICIENCY		
Online	up to 94%	
Eco-mode	up to 98%	
GENERAL		
Technology	Three level inverter, PFC	
Control	Dual-DSP, SPWM	
Paralleling units	Up to 6 units	
Communication	SNMP(Optional), RS232, RS485, MODEM, MODBUS	
Remote monitoring	SNMPView, Remote monitoring panel(optional)	
Dry contacts	Programmable 3 dry contacts	
Custom inputs	Generator, Remote EPO, Remote Start/Stop	
Cold start	Standard	
Maintenance bypass	Standard	
ENVIRONMENT		
Operating temperature	from 0 °C up to +40 °C (from 20 °C to 25 °C for maximum battery life)	
Relative humidity	0% - 85% (without condensation)	
Maximum altitude	≤ 2000 m	
Noise level	< 55 dB (A)	
UPS CABINET		
Dimensions (W x D x H) (mm)	255 x 730 x 870	
Weight (kg)	49	51
Degree of protection	IP20	
Colour	RAL7012	
BATTERY		
Internal battery quantity	30	
Internal battery capacity (Ah)	7-9	
External battery cabinet socket	Standard	
STANDARDS		
Safety	EN 62040-1	
EMC	EN 62040-2	
UPS LIFETIME	10 years	

ELEN reserve the right of changing information in this without report.

AUTHORIZED TECHNICAL SERVICE